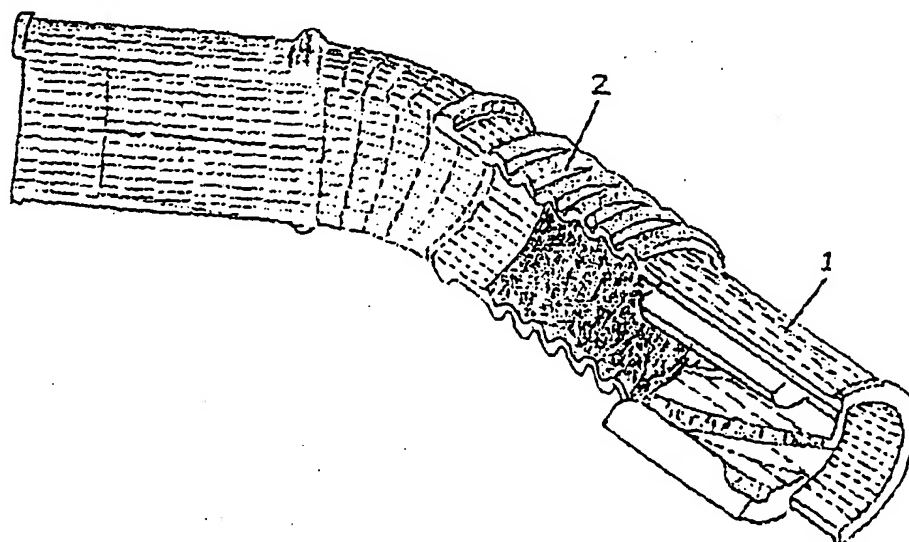




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(54) Title: AIR FLOW-TWISTING DEVICE ON AN AIR INLET SYSTEM OF INTERNAL COMBUSTION ENGINE



(57) Abstract

The invention relates to a device called air flow twisting device that can twist the air lines (1) in an air inlet system of internal combustion engine and the device is installed between the air filter (5) and engine combustion chamber (6). The device comprises a body having a bore therethrough with a length (a+b); two-thirds (a) of said length comprises helical grooves of identical shape and one third (b) of said length having a smooth surface and being connected via a cylindrical flange (3) with the intake manifold in case of an engine with fuel injection or with a carburetor inlet. The device (1) can be made from various materials such as metal, polymer or ceramic.

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DescriptionAIR FLOW-TWISTING DEVICE ON AN AIR INLET SYSTEM
OF INTERNAL COMBUSTION ENGINE

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Technical Field of Invention

The present invention relates to a device called air flow-twisting device on an air inlet system of internal combustion engine, particularly an air flow-twisting device installed after air filter as an accessories means of air inlet system.

Background of Invention

Nowadays, the internal combustion engine is enforced to have high performance engine. One of the important aspect in the internal combustion engine is a perfect mixture of air and fuel, i.e., a homogenously and proportionally mixed air and fuel. Clean air that can be perfectly mixtured with fuel is a must.

A variety of air inlet system have been created for a better combustion effect such as the shapes or other supporting elements. However, such improved shapes and supporting elements which are present, have limited function in increasing speed and cleanness of air inlet system that will flow into mixture chamber of air and fuel after passing air filter to achieve a complete combustion level and a low waste gas emission.

In order to improve combustion process of an internal combustion engine, it is required to design a device or supporting elements in the air inlet system. Such design can increase the mixture of air and fuel flowing uniformly into internal combustion engine chamber.

Short Description of Invention

The present invention is made due to the problems presently exist in the prior invention. Therefore, object of the present invention is to prepare an air flow-twisting device installed in the air inlet system between air filter

and combustion chamber wherein the device will cause the perfect stirred effect and mixture of air and fuel in combustion chamber. The effect thus improves the combustion process and engine performance.

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Brief Description of the Drawing

The objects and features of the invention will be made apparent as the detailed of the description progresses refers to the enclosed drawings, wherein:

10 Figure 1a is a two-dimensional cross section view of basic structure of air flow-twisting device installed at rubber tube for internal combustion engine according to the invention.

15 Figure 1b is three-dimensional cross section view of basic structure of air flow twisting device installed at rubber tube for internal combustion engine.

Figure 2 is a schematic diagram indicating position of air flow twisting device in the air inlet system of internal combustion engine.

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Detailed Description of Invention

Referring to Figures 1a and 1b, it is shown a basic construction of air flow twisting device (1) for internal combustion engine installed at rubber tube (2) of air inlet system. Air flow twisting device with a circumference tube shape having wall thickness corresponds to that wall thickness of rubber tube (2), and both end are cylindrical flange (3). About two-third of inner hollow length (a) from the body of air flow twisting device (4), is formed with twisted extending grooves (4) between the gap and distance of each uniform groove. One-third of the length of air flow twisting device body (b) is made regular inner circumferential hollow and with cylindrical flange end (3). Cylindrical flange end (3) of air flow twisting device (1) is connected into intake manifold (not shown) at the internal combustion engine with injection system or into intake carburator (not shown) when engine uses carburator. Air flow twisting device (1) can be made from various

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material such as metal, polymer or ceramic.

Figure 2 illustrates a schematic diagram which indicates position of air flow twisting device in air inlet system of the internal combustion engine. Air flow twisting device (1) is substantially placed between air filter (5) and internal combustion engine (6). Air flow twisting device (1) can be installed in the air inlet system of internal combustion engine without changing basic construction of the engine. Air flowing in after the air filter (5) is flown-out through air flow twisting device (1). When passing inner hollow of air flow twisting device (1), air is twisted by twisted groove in the inner hollow of air flow twisting device (1) such that air flowing out of air flow twisting device (1) in the twisted condition. Next, the twisted air will create the mixture of air and fuel uniformly disperse causing the stirred effect which creates the distribution of the mixtures of air and fuel in the combustion chamber (6) are more homogenous, and accordingly the engine performance will be greater.

It is to be understood that the description above which refers to the drawings according to the present invention, is not limited to the disclosure. The prior description of the invention represents only for illustration and explanation. All variations and modifications such as number of air flow twisting device in the inner hollow of air flow twisting device, groove shaped and material of air flow twisting device selected which can be carry out by the person skilled in the art, are considered in the scope of invention stated in the enclosed claim.

Claims

1. An air flow twisting device (1) for internal combustion engine which is installed after air filter (5) and before intake manifold or before carburator (combustion chamber (6)), comprising:

a housing body extending circumferentially and has a hollow (a) and (b) with both flens end (3) made of material such as metal, characterized in that geometry shape of inner surface is twisted groove (4) extending at two-third of the length inner hollow of air flow twisting device (1) such that air and/or mixture of air and fuel flowing out of air flow twisting device (1) will twist so the stirred effect which causes combustion even greater.

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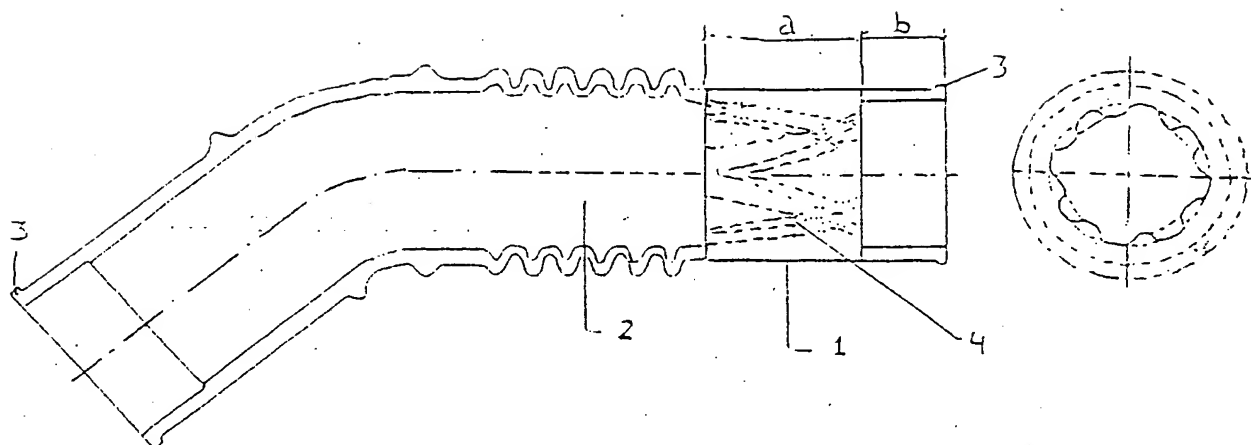


Figure 1a

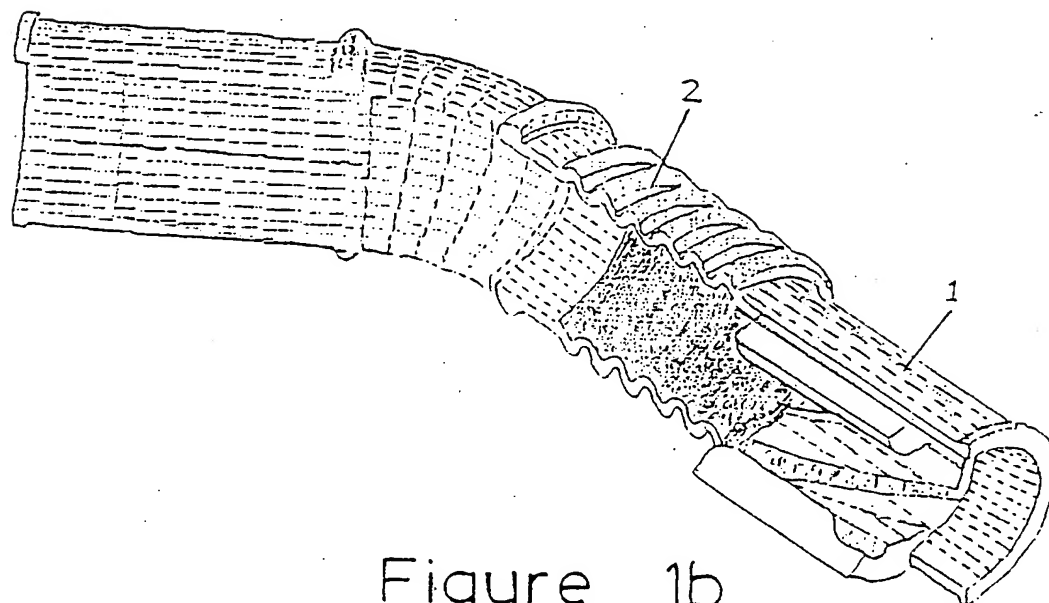


Figure 1b

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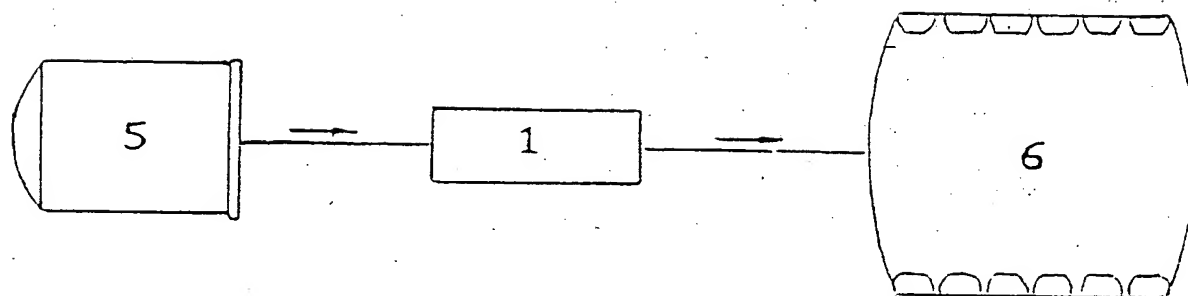


Figure 2

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INTERNATIONAL SEARCH REPORT

Inter national Application No

PCT/IB 99/00029

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 F02M29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 F02M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1 606 916 A (BAGLEY) 16 November 1926 see page 1, line 1 - line 5 see page 1, line 37 - line 55 see figure 1 ---	1
A	GB 2 275 081 A (SEOK HWA SIEW) 17 August 1994 see abstract ---	1
A	US 4 478 198 A (BRUHN) 23 October 1984 see column 3, line 8 - line 14 see column 4, line 59 - column 5, line 1; figures 5,6 ---	1
A	FR 362 694 A (ROTHER) 4 July 1906 see page 1, line 20 - line 24 see page 2, line 15 - line 22 see page 2, line 37 - line 58; figure 1 ---	1
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Date of the actual completion of the international search

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Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 399 679 A (HAPKINS) see page 1, line 46 - line 61 see page 2, line 126 - page 3, line 4; figure 4 ----	1
A	FR 728 486 A (GALLIOT) 6 July 1932 see page 1, line 6 - line 11 see page 1, line 51 - line 57 see page 2, line 16 - line 21 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 1606916 A	16-11-1926	NONE	
GB 2275081 A	17-08-1994	AU 673896 B	28-11-1996
		AU 5976994 A	29-08-1994
		CN 1122625 A	15-05-1996
		DE 69406109 D	13-11-1997
		DE 69406109 T	05-02-1998
		EP 0683860 A	29-11-1995
		WO 9418448 A	18-08-1994
		US 5595157 A	21-01-1997
US 4478198 A	23-10-1984	NONE	
FR 362694 A		NONE	
GB 399679 A		NONE	
FR 728486 A	06-07-1932	NONE	

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